Appendix G
Future Technical Architecture – Alternative 1

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A. Introduction

Alternative 1 is defined as providing the computer support necessary for the implementation of the new CSR/CB human resource business rules to be implemented for the 2003-05 biennium, through modifications to the existing human resource information systems currently operated by HRISD. The Future Technical Architecture provides a conceptual design for meeting that objective, as well as estimated related costs.

B. Components

The components of the Future Technical Architecture for Alternative 1 are listed below:

- Requirements Gap Analysis
- Conceptual System Design
- Technical Component Requirements
- Organizational Impact
- Estimated Schedule
- Estimated Costs

C. Information Sources

In addition to information already accumulated during the Feasibility Study, information specific to the Future Technical Architecture for Alternative 1 was gathered from the following sources:

- Interviews with DOP, HRISD, and DIS managers and staff.
- HRISD system documentation archives.
- DOP and HRISD CSR/CB work-in-progress documentation.

II. Requirements Gap Analysis

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A. Approach

Business requirements related to the HRISD Personnel, Leave and Payroll information systems to support CSR/CB, were identified in focus group sessions with state employees during the needs assessment portion of the feasibility study. Each requirement identified was given a rating of High (must have), Medium (desired enhancement), or Low (nice to have). Ratings by HRISD system are quantified in Exhibit II-1.

Exhibit II-1: Requirement Ratings by HRISD System

Rating	Personnel	Leave	Payroll	Total
High	159	37	96	292
Medium	13	2	13	28
Low	19	1	1	21
Total:				341

After the requirements were identified and rated, the DOP reviewed the results and determined that 133 of the 341 requirements were necessary for implementation for the 2003-05 biennium. All 133 were rated High.

The requirements were compared to the capabilities of the current HRISD Personnel, Leave, and Payroll Systems. The comparison process was assisted by 12 HRISD staff members with expertise in human resource business rules, as well as current subsystem functionality. Each requirement was mapped to one or more HRISD subsystem, and designated as being partially or fully supported by current system capabilities, or not supported at all.

B. Analysis Results

The gap analysis effort identified 17 subsystems requiring modification as illustrated in Exhibit II-2.

Exhibit II-2: Subsystems to be Modified

System	Subsystem
Personnel	Automatic Salary Increase Conversion.
	Periodic Salary Increment/Appointment Status Change
	Performance Evaluation Due
	Personnel Reporting (Activity and Status)
	ARMS/INET
Leave	Leave/Attendance Reporting.
Payroll	Generic Pay Feed
	Labor Load (DOT and DOT Marine Division)
	Automatic Warrant Cancellations
	Payroll Calculations
	Main Payroll Reporting (JV, Warrants, Earnings Statements)
	Subsequent Payroll Reporting
	Deduction Reporting
	AFRS/OST Reporting
	Biennium Payroll Reporting
	Year-end Wage Reporting (W-2, 1099, SSA)
General	Data Warehouse

C. Gap Analysis Matrix

Exhibit II-3 contains the Gap Analysis Matrix illustrating the detailed results of the requirements gap analysis. It contains the 133 requirements necessary to support the 2003-05 biennium implementation of CSR/CB. For ease of comparison, each requirement is identified with the same numbering schema as the Requirements Matrix located in Appendix E.

The current subsystems that support the requirement now or will need to support it in the future, are indicated by the existence of a code in the appropriate subsystem column. The three coded values are defined as follows:

- **F** – Fully supported by the existing subsystem. No modification necessary.
- **P** – Partially supported by existing subsystem. Some modification necessary.
- **N** – Not supported by existing subsystem.

Exhibit II-3: Gap Analysis Matrix

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
High Priority Requirements – Personnel																			
	1.1.0 Manage Human Resources																		
		Ability to capture by effective date:																	
1	4	Personal data (name, address, etc.)				P	P											P	P
2	6	Work history at current and prior agencies (within State government).	P			P		P											P
3	8	Education, training, national certifications, licensure (w/expiration dates).				P	P												P
4	9	Job classifications.	P	P		P	P												P
5	10	Employment categories (entry level, supervisory, front line, etc.)				P													P
6	11	Salary history.	P	P		P						P							P
7	15	Disciplinary actions.				P													P
8	17	Bargaining unit.	N	N		N		P	N	N		P	N	N		N			N
9	18	Master contract.	N	N		N		N	N	N		N	N	N		N			N
10	19	Employee Status (seasonal, temp, FT, PT, volunteer, intern, apprentice, in-training).		P	P	P						P							P
11	20	Business unit.	N	N	N	N		N			N	N	N	N		N		N	N
12	23	Seniority information.				P		P											P
13	27	Ability to system-generate a universal employee identification number.				N													P
14	30	Ability to track temporary employees nearing certain hours thresholds.				F													N
15	31	Ability to accrue seniority by hours or by dates.				P		P				P							

#		Requirements for 2003-05	Subsystem																	
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
16	33	Ability to track initial, lateral transfer, and promotional probationary period.		P	P	P													P
17	34	Ability to track multiple probationary periods (trial service periods).		P	P	P													P
18	35	Ability to transfer an employee to a new location without terminating and rehiring and maintain all history.				P													P
19	36	Ability to track actual physical work location of employees (geographic location).				N													N
20	39	Ability to maintain history for a significant number of years (>25) to allow checking for leaves of absence, reasons for termination, termination dates, etc.				P													P
	1.2.0 Perform Organization and Staffing Analysis																			
		Ability to provide for the definition of position characteristics such as:																		
21	2	Location (geographic location).				P													N
22	4	Shift and work days.				P													P
23	6	Status.				P													P
24	7	Retirement eligible				N													N
25	8	Position evaluation points (e.g., For allocating various positions to certain salary bands).				P													N
26	9	Assignment Pay.				P													P
27	10	Dual language.				P													P
28	11	Selectives.				N	F												N
29	14	Ability to support position banding including range/step data if fields populated.	N	N		N	N												
30	15	Ability to support position versus job classifications.	N	N		N													

#		Requirements for 2003-05	Subsystem																
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31	16	Ability to support position grades and steps.	P	N		P													P
32	17	Ability to track salary ranges, grades, and steps by effective date.	P	N		P													P
33	19	Ability to create work force composition reports.				P													P
34	20	Ability to establish low/high and median salary scales.				P													P
35	21	Ability to maintain budgeted FTEs as well as salary amounts and calculate variances.				N													N
36	22	Ability to track funding source to position funded.				P								F					P
37	23	Ability to track both funded and unfunded vacancies.				N													N
38	24	Ability to plan and forecast human resource requirements.				N													N
39	25	Ability to forecast eligible retirees, based on bargaining unit category, age, years of service, and retirement plan (Part of workforce composition reports).				P													P
40	26	Ability to track employee turnover by department, classification, ethnicity, gender, geographic location, etc. (Part of workforce composition reports).				P													P
	1.3.0 Complete Position Classification																		
41	3	Ability to double and triple fill positions and track.				P	P												P
42	5	Ability to accommodate employees who work in multiple positions at the same time.				N													N
	1.4.0 Manage Employee Performance																		
43	1	Ability to support performance reviews.			N	N													N
44	3	Ability to track completion rates of employee reviews.			N	N													N
45	4	Ability to track performance ratings by demographics, departments, age, division, etc.			N	N													N

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
46	5	Ability to capture employee performance appraisal history.			N	N													N
47	6	Ability to track merit increase (%) by organization, fund, etc.				N								P					N
48	7	Maintaining history of the actions.				P													P
		Ability to provide employment activity analysis reports for the following:																	
49	12	Promotions.				P	P												P
50	13	Terminations.				P	P												P
51	14	Layoffs and recalls.				P	P												P
52	15	New hires.				P	P												P
53	16	Lateral Transfers.				P	P												P
	1.5.0 Compensate, Recognize and Reward Employees																		
54	4	Ability to track and reward attendance, safe driving, etc. (Monetary).				N		N			P	P	P	P					N
55	5	Ability to build business rules based on initial salary over designated amount (assignment pay).	P	P		P			P	P	P	P	P	P					
56	6	Ability to support Performance Incentive Pay.		N	N	N			N	N	N	N	N	N					
57	7	Ability to support Interim Assignment Pay.							P	P	P	P	P	P					
58	8	Ability to support various levels of pay & pay scales within the same job class.	N	N		N			N	N	N	N	N						N
59	9	Ability to support "Y-Rates" (i.e., an employee is paid above the maximum salary in a classification and may be exempt or receive different amounts from COLA's, etc.).	P	P		P													P

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
60	10	Ability to support business rules for calculating compensation such as apprentices receiving a percentage of the normal salary for a classification, or volunteers receiving no salary and only the state portion of the L&I premium paid.	N	N		N			N	N	N	N	N	N					
61	11	Ability to store history information for both Performance Incentive Pay and Interim Assignment Pay to track total paid by department, year, etc.		N	N	N			N	N	N	N	N	N					N
62	12	Ability to support 'what if' salary scenarios such as cost of living increases, etc.	P			P													P
63	13	Ability to provide additional compensation for positions requiring special skills.	N			N			N	N	N	N	N	N					
64	14	Ability to support geographic/regional pay and special pay.	N			N			N	N	N	N	N	N					
65	15	Ability to support lump sum bonus payments to retain personnel, meet market conditions, etc.							N	N	P	P	P	P					
66	16	Ability to support automatic periodic increments by percentage or range in and step.		P		P													
	1.6.0 Manage Employee Relations																		
67	7	Ability to support layoffs/RIFs considering various criteria.				N													
68	8	Ability to maintain and report on recall lists.				N	P												N
69	11	Ability to track separation reasons by employee type, department, or other organizational entity.				P													P
70	14	Ability to maintain and report on employee seniority.				P		P											P
71	15	Ability to maintain layoff lists by employee, seniority, etc.				N													N
72	4	Ability to maintain and report on bumping lists.				N													N

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
73	5	Ability to maintain and report on recall list (RIF register).				N													N
74	6	Ability to support layoffs/RIF's considering various criteria (i.e. performance, seniority).				P													P
		Ability to maintain workforce reports by:																	
75	16	Budget Unit (Account Code)				P													F
76	17	Bargaining Unit (Agency, Division, Program, Work Unit, Location, Which members are paying dues)				N													N
		Ability to attach employee organization and/or union membership to an employee at:																	
77	24	Master Agreement Level.	N	N	N	N		N	N	N	N	N	N	N		N			N
78	25	Bargaining Unit Level.	N	N	N	N		N	N	N	N	N	N	N		N			N
79	26	Business Unit (applicable for contracting out).	N	N	N	N		N	N	N	N	N	N	N		N			N
80	32	Ability to transmit dues and agency fees to certified agent.										P	P	P	P				
81	34	Ability to furnish transaction reports to union on number of employees in unit, etc.				N													N
82	35	Ability to maintain and report on employee seniority.				P		P											P
High Priority Requirements – Leave																			
	2.1.0 Manage Paid Time-Off																		
83	4	Ability to capture and track multiple leave types (including jury, election, religious, military, bereavement, disaster, volunteer activities, paid & unpaid sabbaticals, personal holidays, educational, administrative, suspensions, etc.).				P		P		P	N	N	N	N					P
84	5	Ability to add new leave types and define how they are used.						N		P	N	N	N	N					

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
85	11	Ability to accrue sick leave time based on straight time paid bi-weekly, weekly.						P											
86	12	Ability to accrue sick leave time based on work status, hours worked, years of service, and eligibility.						P											
87	13	Ability to accrue vacation leave time based on work status and years of service.						P											
88	14	Ability to track vacation maximums and hours lost.						P											P
89	15	Ability to allow excess annual leave to accrue until employee anniversary date.						P											
90	18	Ability to accrue personal holidays based on a variety of criteria.						P											
91	20	Ability to track comp time expiration based on periods.						N											N
92	21	Ability to pay out comp time balances.						P			P	P	P	P					
93	22	Ability to convert leave from one type to another.						N											
94	23	Ability to convert leave to cash on a yearly basis, at termination or at retirement.						P			P	P	P	P					
	2.2.0 Manage Leave Without Pay																		
95	6	Ability to track FMLA used.				P		N											N
96	7	Ability to track FMLA taken by spouses that are also State employees.				P		N											N
97	9	Ability to track concurrent FMLA leaves.						N											N

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
High Priority Requirements – Payroll																			
	3.1.0 Manage Time and Attendance Collection																		
98	3	Ability to support cost accounting, labor distribution, etc.									P	P	P	P		P			P
99	9	Ability to specify multiple holiday schedules that drive payment of appropriate holiday pay based on the employee's holiday schedule.						N	N	N		N							
100	10	Ability to support multiple calendars, work types (e.g., telecommuting, comp time, overtime), projects and work schedules.							N	N		N							
101	11	Ability to support on-call pay.							P	P	P	P	P	P					
102	12	Ability to track which shift worked.							N	P	N	N	N	N					N
103	13	Ability to support continuous 24X7 schedules.							P	P	P	P	P	P					
104	14	Ability to support telecommuting.							N	N	N	N	N	N					P
105	15	Ability to support flexible work schedules.							P	P	P	P	P	P					
	3.2.0 Perform Calculations and Disbursements																		
106	1	Ability to support multiple pay cycles.	N	N		N		N	N	N	N	N	N	N	N	N	N		N
107	2	Ability to accommodate weekly, bi-weekly, semi-monthly, and special payroll runs.	N	N		N		N	N	N	N	N	N	N	N	N	N		N
108	3	Ability to define multiple work weeks and calculate overtime accordingly.										P							N
109	6	Ability to allow voluntary deductions that are a percentage of an employee's base pay or other bases (up to a maximum).										P							
110	11	Ability to deduct or not deduct any given deduction on a special payroll on an employer or employee basis.										P	P	P	P	P			
111	12	Ability to process one-time deductions.										F	F	F	F	F			

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
112	15	Ability to electronically transmit deductions to appropriate agencies/vendors.													P				
113	19	Ability to allow for accurately handling Section 125 deductions/plans.									P	P	P	P	P	P		P	
114	27	Ability to process and calculate retro pay.							N	N	N	N	N	N	N				
115	28	Ability to calculate shift pay based on employee's base pay or other criteria.							P	P	P	P	P	P					
116	29	Ability to support payment of employee allowances (i.e., car, clothing, etc.).									P	P	P	P					
117	30	Ability to track multiple pay types (regular, overtime, supplemental).							P	P	P	P	P	P					P
118	31	Ability to add new pay types and define how they are used.							N	P	N	N	N	N					P
119	36	Ability to allow 1.0, 1.5, 2.0, etc overtime pay.							P	P	P	P	P	P					
120	39	Ability to provide a holiday schedule that will automatically pay holiday pay to eligible employees.									N	N	N	N					
121	46	Ability to support compliance with all federal and state legislation for imputed income (taxable fringe benefits).									P	P	P	P				P	
122	47	Ability to provide a gross-up calculation routine (e.g., grievance award).										N							
123	48	Ability to provide grossed up amounts to be displayed on the employee's earning statement showing gross, taxes, and net with a description.											N						
124	49	Ability to produce checks on demand.							N	N	N	N	N	N	N	N	N		
125	52	Ability to provide for employer matching contributions.									P	P	P	P					
126	53	Ability to support allowances and appropriate taxing options (e.g., Uniform allowance).										P							

#		Requirements for 2003-05	Subsystem																
			Salary Conv	Salary Incre	Perf Eval Due	Personnel Rpt	ARMS/INET	Leave/Atten	Gen Pay Feed	Labor Load	Warr Cancel	Pay Calc	Main Pay Rpt	Sub Pay Rpt	Deduct Rpt	AFRS/OST	Bi Pay Rpt	Year-End	Data Ware
127	54	Ability to support mass updates (i.e. COLAs).	P																
128	59	Ability to add year-to-date fields for W-2's.									N	N	N	N				N	
129	60	Ability for an employee to receive both a 1099 and a W-2.									N	N	N	N		N	N	N	
130	67	Ability to allow State contributions to health, deferred compensation and other deductions to be computed as either a flat rate, a percentage of gross or a percentage of employee contributions.									P	P	P	P					
131	70	Ability to support self-pay of benefits for various reasons.										N	N	N					
132	72	Ability to support FLSA calculations and non-FLSA calculations.										P							
133	74	Ability to tie payment of OT to appropriate FLSA categorization & calculation.										P							

III. Conceptual System Design

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A. Application Infrastructure

No significant changes to the current application infrastructure design have been identified in either the mainframe or client/server and web environments.

B. Technical Infrastructure

No significant changes to the current technical infrastructure design have been identified in either the mainframe or client/server and web environments.

IV. Technical Component Requirements

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A. Hardware and System Software Requirements

HRISD will need desktop computers and supporting network connections, along with some important additions to the systems services available from DIS.

1. Client/Server and Web Environment

a. Hardware

Additional desktop computers and client software will be required for project staff members. It is expected that additional contract programmers will be hired to complete the development work, working alongside selected members of HRISD's technical staff. In addition, contractors will be hired to take on the normal maintenance and development workload normally performed by assigned HRISD staff. All of these individuals will require additional workstations, including network connections, to complete work on the mainframe, as well as in the client/server and web environment. Those working in the latter environment will need sufficient workstation memory and disk space capacity, along with appropriate development tools, to work effectively. This will mean purchase of new workstations and associated software.

No additional server-level hardware or software is required within the client/server and web environment.

b. Development Tools

Developer workstations used for development in the client/server and web environments will require a suite of design and development tools.

2. Mainframe Environment

a. Expanded test environment

In order to effectively develop the modifications required to current mainframe systems, HRISD will require an expanded test area operating within the DIS operations environment which is currently used to operate HRISD supported

applications. This will add cost to the current interagency agreement and Service Level Agreement between HRISD and DIS.

b. Additional storage

Additional data and databases will be required to support the CSR/CB development effort. HRISD estimates that additional disk space will be required in the mainframe environment to support this.

B. Workstations

It is assumed that no new workstations or workstation configurations will be required upon implementation of the modification alternative.

C. Network Components

It is assumed that no new network components will be required upon implementation of the modification alternative.

V. Organizational Impact

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A. Production and Support Processes

1. Service Level Agreements

Modifications to HRISD's Service Level Agreement with DIS will likely be needed to reflect the additional technical resources DIS must provide to support the expanded test environment.

2. Data Sharing Agreements

HRISD currently has two Data Sharing Agreements (DSA's) in place: one with the Department of Retirement Systems, and another with the Office of Financial Management. A DSA is being developed with the Office of the State Treasurer. Additional DSA's may be required as a result of this project to support the data needs of other state agencies and, possibly, the unions.

B. Project Management and Systems Development Practices

HRISD has made substantial progress in the last few years in improving its project management and system development practices, including significant improvements in its system testing practices. These improvements include drafting and implementing guidelines for project management, requirements development, testing, and other components of the system development process. HRISD is also providing in-house training on these topics to staff. These efforts should continue and be further expanded as HRISD undertakes proposed system changes.

It will be critical to the success of this project that HRISD continue to improve its project management and development practices. This includes developing detailed, documented processes and procedures, developing clearly defined roles, and providing training in these procedures to all HRISD staff.

C. Documentation

As discussed in the Current Technical Architecture document, system design documentation is not available for any of the current systems. The completion of at least high-level documentation of all systems, and providing a centralized on-line index of the

available documentation, will be important to the efficient and accurate completion of required system changes.

D. New Skill Sets Needed

It is assumed that no new skill sets will be required to support the modification project after implementation.

E. Project Staffing

Considering the project's magnitude, the State may wish to consider organizing a Project Management Office and seeking the services of an external integrator to direct it. Though an "integrator" approach would reduce project risk, it would add significantly to project cost and has not been included in the staffing projections.

HRISD has directed that all technical project staffing be external resources acquired on a contract basis. Exhibit V-1 displays the estimated staffing requirements of Alternative 1.

Exhibit V-1: Estimated Staffing Requirements

Category	Months	FTE's
Lead Project Manager	30	1
Project Managers/Developers	24	22.6
Requirements Developers	6	3
Business Architects	24	3
Trainers	18	2
Technical Writer	18	1
Production Support Staff	24	.5
Database Management Staff	24	2
Environment Management Staff	24	.5
Help Desk Staff	24	.5
Network Support Staff	30	.5
Total:		36.6

1. Lead Project Manager

The Lead Project Manager will direct the overall effort, paying particular attention to schedule, budget, and deliverables, and will directly supervise the project managers

working on individual systems. The project director will coordinate closely with HRISD's Assistant Director and with the Resource Managers for each of HRISD's technology and functional areas.

2. Project Managers

Project managers will be responsible for individual teams of developers. A project manager will direct day-to-day activities of a team, develop and monitor schedules, and review and monitor tasks and deliverables.

3. Developers

The developers category consists of developers, testers and internal quality assurance personnel. The developers and testers will perform all systems analysis, detailed design, coding, unit testing, system testing, and stress testing functions. They will support customer acceptance testing activities, and provide technical support to system implementation. Internal quality assurance personnel will supervise the test team, develop testing processes and the customer acceptance test plan, monitor test results, and coordinate with implementation and training activities.

a. Client/Server and Web Environment Skill Sets

- SQL Server stored procedures
- ASP
- IDC script
- VB Script
- Java Script

b. Mainframe Skill Sets

- Advanced analysis, design, and programming skills
- COBOL
- ADABAS
- NATURAL

4. Requirements Developers

Requirements developers will confirm requirements with DOP managers and customer agency representatives. Based on these confirmed high-level requirements, they will develop detailed requirements and design documents, including processing, data, network, and performance requirements.

5. External Quality Assurance

The external quality assurance contractor will provide oversight to ensure that scope and schedule are effectively managed, that milestones are met, that appropriate management and development processes are being used, and that the resulting system changes meet customer expectations and requirements.

6. Business Architects

Business architects will work closely with developers, internal quality assurance, trainers, and the technical writer, to ensure that system changes, training, and documentation reflect the detailed business requirements and needs of users.

7. Help Desk Staff

Help desk staff respond to questions from users and business and technical personnel representing customer agencies. These questions will cover anticipated changes to HRISD systems, how systems operated by customer agencies must change to accommodate HRISD changes, and customer agency process changes required.

8. Trainers

The trainers will develop, test, and deliver training related to new or modified screens, reports, or other system features and functions resulting from this project.

9. Technical Writer

The technical writer will modify all user manuals and supporting material to reflect system changes. This role will also be responsible for creating and modifying system documentation to reflect these changes.

10. Database Administration

The work of database administration involves establishing new files and fields in the test databases, managing the multiple database used for the project, populating and refreshing multiple development, and testing databases for several project teams working simultaneously.

11. Technical Environment and Change Management

This individual will monitor and manage job scheduling for the project, will manage reports and other output media generated, will assist in production verification activities, will support test abends and maintenance fixes, and will monitor system

performance and make appropriate adjustments. This person will set up the enhanced testing environment for use by developers and testers, and will support that environment throughout the project. This individual is also responsible for managing program and job libraries and versions, and developing and supporting check-in/check-out and program/system migration procedures.

12. Network Support Staff

Network support staff will install and support additional networking hardware and software needed to support the project team. This person will also provide workstation and application support for all project staff, and for software running on the network or on the local PCs. This person will ensure that all project staff computers stay up and running and connected to the network at all times to maximize staff productivity. It is expected that project staff will be quite transient, with individuals regularly joining and leaving the team depending on the varying staffing demands of the project. This will create more demand for network support to properly re-configure desktop machines with logon IDs, passwords, and permissions.

F. Ongoing Staffing

For ongoing support after implementation, no new organizational units will be required. Maintenance, customer interface, help desk, and other needs can be met within HRISD's current organizational structure.

G. System Stabilization Effort

Since 2001, HRISD has been engaged in planning and implementing technical strategies to stabilize the design and architecture of the current mainframe human resource information systems. This effort includes identifying subsystems and functions that could benefit from migration to a client/server or web platform. Because these strategies are in various stages of development, they do not provide a sufficient foundation upon which to confidently base estimates for the implementation of Alternative 1. However, they do deserve mention in this document since they potentially supply a strategy for meeting some of the CSR/CB requirements that could reduce the implementation costs associated with this alternative.

The most significant potential savings appear to be related to system stabilization efforts focused on the following HRISD systems:

- Performance Evaluation Due Notification
- ARMS/INET
- Data Warehouse

VI. Estimated Schedule

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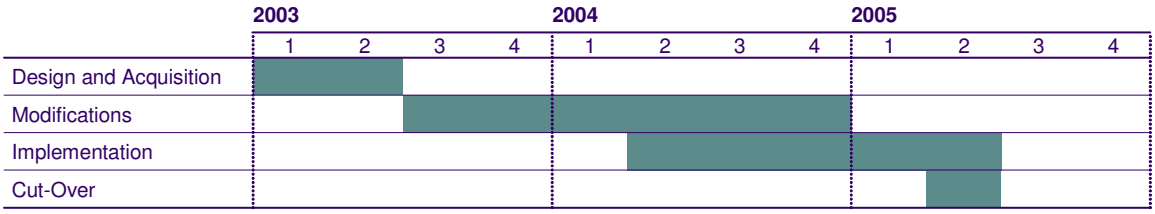
A. Project Timeline

The estimated timeline for Alternative 1 is illustrated in Exhibit VI-1.

Exhibit VI-1: Project Timeline



B. Activities

1. Design and Acquisition

During the Design and Acquisition phase, detailed requirements and the conceptual design are completed. Proposals for completing the modifications are solicited and reviewed, and contracted personnel and/or companies are selected to assist with developing and implementing the modifications to current systems.

2. Modifications

Current systems are modified and tested during the Modification phase. System and user documentation is prepared as well, and training and implementation plans are developed. This includes building or modifying database and other files, modifying programs and related job streams (JCL), and conducting unit, integration, stress, and customer acceptance tests for all system changes.

3. Implementation

During the Implementation phase, training is provided to system users. Appropriate changes to user documentation are distributed. Changes in user processes, procedures, and forms are finalized and implemented in coordination with system changes.

Required changes to customer agency interfaces are implemented to adjust to changes in data content and/or format for those interfaces required by CSR/CB. Those system components which can be implemented immediately are transferred to production and made available to users.

4. Cut-Over

The final system components are transferred to production and made available to users during the Cut-Over phase. Transitional issues are identified and resolved as well and a post-implementation review is conducted.

VII. Estimated Costs

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A. Staffing

1. Assumptions

The assumptions employed when estimating staffing requirements are as follows:

- All technical project staffing will be from external sources at contractor rates.
- Contractor rates include expenses.

2. SPC ESTIMATE Professional

SPC ESTIMATE Professional is a statistically-based software package marketed by Software Productivity Center, Inc., which has been used successfully by HRISD to estimate previous projects. It employs Monte Carlo simulation to generate a set of estimates with different probabilities. Either a size- or effort-based approach can be utilized. For this project, a size-based approach was chosen. It employs the size of current programs – as measured by lines of code – and actual historical time and effort data from previous program modification efforts. SPC ESTIMATE Professional produces estimates for the following technical staffing categories:

- Project Managers
- Developers

SPC ESTIMATE Professional was executed for all subsystems. The resulting estimates were reviewed for reasonableness by a team of HRISD managers and staff familiar with the CSR/CB business requirements and with the historical work that has been performed on each subsystem. The team compared the complexity of previous work to that anticipated for CSR/CB and modified the SPC ESTIMATE Professional estimates when disparities were detected.

No historical information was available for the Data Warehouse subsystem. Resource estimates were developed based on input from HRISD staff and generally accepted industry estimating standards and practices.

Two rates were employed for costing purposes; project managers were estimated at $160/hour, all other resources at $95/hour. Estimated subsystem modification costs are displayed by subsystem in Exhibit VII-1.

Exhibit VII-1: Estimated Subsystem Modification Costs

Subsystem	Hours	Cost$	Total$
Personnel			
Automatic Salary Increase Conversion	905	94,804	
Period Salary Increm't/Appointm't Status Change	696	72,842	
Performance Evaluation Due Notification	725	76,098	
Personnel Reporting	20,260	2,122,271	
Leave/Attendance Reporting	16,694	1,748,730	
ARMS/INET	5,018	542,406	4,657,151
Payroll			
Generic Pay Feed	159	16,696	
Labor Load	147	20,588	
Automatic Warrant Cancellations	510	53,358	
Payroll Calculations	20,260	2,122,271	
Main Payroll Reporting	7,646	800,850	
Subsequent Payroll Reporting	12,447	1,303,816	
Deduction Reporting	498	52,142	
AFRS/OST Reporting	3,722	389,799	
Biennium Payroll Reporting	551	57,705	
Year End Reporting	429	44,933	4,862,158
Other			
Data Warehouse	3,226	341,376	341,376
Total:			**9,860,685**

3. Additional Staffing

Since the resource hours provided by SPC ESTIMATE Professional are limited to certain technical staffing categories, the additional resources needed by the project have been estimated separately. The estimated additional staffing costs are displayed in Exhibit VII-2.

Exhibit VII-2: Estimated Additional Staffing Costs

Category	Basis	Rate$	Hours	Cost$
Lead Project Manager	1@30 mo.	175	5200	910,000
Requirements Developers	3@6 mo.	125	3120	390,000
Business Architects	3@24 mo.	125	12480	1,560,000
Trainer	2@18 mo.	65	6240	405,600
Technical Writer	1@18 mo.	65	3120	202,800
Production Support Staff	.5@24 mo.	90	2080	187,200
Database Management Staff	2@24 mo.	90	8320	748,800
Environment Management Staff	.5@24 mo.	90	2080	187,200
Help Desk Staff	.5@24 mo.	90	2080	187,200
Network Support Staff	.5@30 mo.	105	2600	273,000
Total:				**5,051,800**

B. External Quality Assurance

The estimated external quality assurance costs are displayed in Exhibit VII-3.

Exhibit VII-3: Estimated External Quality Assurance Costs

Category	Basis	Rate$	Hours	Cost$
QA Director	1	215	2,250	483,750
QA Functional Resource	1	140	1,125	157,500
QA Technical Resource	1	125	1,125	140,625
Travel Expense@15%	n/a	n/a	n/a	117,281
Total:				**899,156**

C. Facilities

Facilities costs are those costs associated with housing a maximum of 45 temporary project personnel at any given time over the project's lifecycle. The estimated facilities costs are displayed in Exhibit VII-4.

Exhibit VII-4: Estimated Facilities Costs

Description	Basis	Cost$	Total$
Office Space	5250/sqft/2 yrs.	20/sqft/yr.	210,000
Desks and Chairs	45 sets	377	16,970
Telephones	45	100	4,500
Telephone Service	45/24 mo.	36/mo.	38,880
Miscellaneous Supplies			4,000
Total:			**274,350**

D. Equipment

The equipment costs include desktops for project staff, as well as the necessary network equipment and data line necessary to connect the desktops to the HRISD Local Area Network. The estimated equipment costs are displayed in Exhibit VII-5.

Exhibit VII-5: Estimated Equipment Costs

Description	Basis	Cost$	Total$
Client/Server Developer Desktop	2	5,000	10,000
Mainframe Developer Desktop	43	2,000	86,000
Network Router	1	8,000	8,000
Network Switch	2	5,000	10,000
T1 Communications Link	24 months	1,000/mo	24,000
Miscellaneous Network Equipment	n/a	n/a	2,000
Total:			**140,000**

E. DIS Charges

DIS change costs are those associated with the additional demand for data storage and computer processing. The estimated equipment costs are displayed in Exhibit VII-6.

Exhibit VII-6: Estimated DIS Charges Costs

	Months	Cost$	Total$
Database and data storage charges	24	34,000/mo.	816,000
Total:			**816,000**

F. Operations

Operations costs are those associated with the post-implementation operation over a certain period of time. For the purposes of this study, the operational period has been designated as fiscal years 2005 through 2013. The estimated operational costs are displayed in Exhibit VII-7.

Exhibit VII-7: Estimated Operations Costs

	Years	Cost$	Total$
DIS Charges	8	18,000/yr.	144,000
Total:			**144,000**